

Carr 3-10-3

Remarks

Reconsideration of pending claims 1-17 is respectfully requested.

In the Office action dated September 25, 2003 (application Paper No. 17), the Examiner issued a Final Rejection of all pending claims under 35 USC 103(a). The Examiner's various rejections will be discussed below in the order appearing in the Office action.

35 USC § 103(a) Rejection - Claims 1, 2, 4, 6, 11, 13, 14 and 17

The Examiner first rejected the above-cited group of references under 35 USC 103(a) as being unpatentable over US Patent 6,433,411 (Degani), of record, in view of US Patent 5,952,712 (Ikuina), of record, and JP 09261975 (Higuchi), also of record.

In the rejection, the Examiner stated that "Degani further lacks conductors formed on a major surface of the substrate. Ikuina teaches the use of conductors (17) on a ceramic substrate (12) with via holes (15) in the substrate and the substrate connected to a silicon layer (11). *It is not clear if the conductors (17) of Ikuina are inside via holes (15) therefore the examiner will assume the conductors are not passing through the via holes*" [emphasis added].

Applicants assert, in response to the Examiner's statement, that Ikuina does indeed clearly describe the utilization of "conductors 17" that pass through via holes 15. The Examiner is referred to FIG. 1 of Ikuina that illustrates "conductor 17" as the layer marked with the metallic PTO designation ("/////"), and obviously connecting conductor 14 to conductor 16 through via hole 15. The Examiner is also referred to Ikuina at column 4, beginning at line 36, which states: "The electrode 14 formed on the integrated circuit of the LSI chip 11 is connected to the electrode 16, formed on the package 12 to be connected to the board, with the connecting conductor 17 through the through hole 15" [emphasis added]. Thus, in the arrangement of Ikuina, a direct, physical electrical connection is made between a first electrode on a ceramic substrate and a second electrode on a silicon substrate.

Carr 3-10-3

Therefore, applicants conclude that Ikuina *teaches away* from the use of an "electrostatic force" such that "the utilization of conductors on the silicon layer is not required", as defined in amended claim 1, or conductors that "remain separated from" the silicon layer so as to "operate the array of mirrors using an electrostatic force" as defined in independent claim 12. The remaining independent claims contain similar language.

On this basis, applicants assert that the combination of Degani, Ikuina and Higuchi cannot be found to render obvious the subject matter of the rejected claims. Applicants therefore respectfully request the Examiner to reconsider this rejection and find claims 1, 2, 4, 6, 11, 13, 14 and 17 to be in condition for allowance.

35 USC § 103(a) Rejection - Claim 3

Claim 3 was next rejected by the Examiner under 35 USC 103(a) as being unpatentable over Degani in view of Ikuina and Higuchi (as applied above), in further view of an article by Lin (of record), where Lin was cited as teaching that an array of size 3x3 can easily be expanded to an array of 8x10.

Regardless of the teaching of Lin, applicants assert that the combination of cited references still lacks any teaching of controlling the operation of an array of electrostatically activated members without including an electrical contact on the silicon layer of the device structure. For the reasons discussed above, the cited Ikuina reference does indeed disclose and teach the use of a "conductor" 17 through a via hole 15 between a first conductor 14 and a second conductor 16.

Applicants therefore respectfully request the Examiner to reconsider this rejection and find claim 3 to also be in condition for allowance.

35 USC § 103(a) Rejection - Claim 5

Claim 5 was next rejected by the Examiner under 35 USC 103(a) as being unpatentable over Degani, Ikuina and Higuchi (as above, applied to claim 1), in further view of US Patent 6,393,187 (Engleberth). The Engleberth reference was cited by the Examiner as teaching the use of a metal layer deposited on a silicon layer. However, the Engleberth reference is not germane to the subject matter of MEMS technology, but to an optical fiber-based free space optical switch. Regardless of the subject matter of

Carr 3-10-3

Engleberth, however, it is asserted that the combination of Engleberth with Degani, Ikuina and Higuchi still lacks any teaching of using a separate silicon layer and ceramic substrate, as defined by claim 5 (based on independent claim 1). Applicants therefore respectfully request the Examiner to reconsider this rejection and find claim 5 to be in condition for allowance.

35 USC § 103(a) Rejection - Claims 7 and 9

Claims 7 and 9 were next rejected by the Examiner under 35 USC 103(a) as being unpatentable over Degani in view of Ikuina and Higuchi (as applied to claim 1), in further view of an article by Imanaka (of record). Imanaka was cited for its teaching of the properties of a ceramic material (in particular, for the use of aluminum nitride and issues regarding its roughness). However, the combination of Imanaka with Degani, Ikuina and Higuchi still lacks any teaching of using separate silicon and ceramic members for the optic and electronic portions of a MEMS device, as defined by independent claim 1, from which both claims 7 and 9 depend. Applicants thus respectfully request the Examiner to reconsider this rejection and find claims 7 and 9 to be in condition for allowance.

35 USC § 103(a) Rejection - Claim 8

The Examiner next rejected claim 8 under 35 USC 103(a) as being unpatentable over Degani in view of Ikuina and Higuchi (as applied to claim 1), in further view of Lin (as above). The Examiner particularly cited Lin as teaching the use of a substrate with a flatness less than 10 microns (particularly, Lin teaches a flatness of 0.5 microns). Regardless of the teaching of Lin, applicants assert that the combination still lacks any teaching regarding the use of a first element (a silicon layer) to form the actual MEMS array and a second element (a ceramic substrate) to form the electronics for controlling the MEMS array. Without this teaching, applicants assert that the cited combination cannot be found to render obvious the teachings of claim 8, which ultimately depends from claim 1 (as discussed above). Applicants therefore respectfully request the Examiner to reconsider this rejection and find claim 8 to be in condition for allowance.

Carr 3-10-3

35 USC § 103(a) Rejection - Claim 10

The Examiner next rejected claim 10 under 35 USC 103(a) as being unpatentable over Degani in view of Ikuina and Higuchi (as applied to claim 1), in further view of US Patent 6,329,607 (Fjelstad), of record, and US Patent 6,284,656 (Farrar), of record. The Fjelstad and Farrar references were cited by the Examiner as teaching particular line width and spacing requirements for conductors in microelectronic structures. However, this combination still lacks any teaching of utilizing separate substrates for MEMS devices and their associated conductors, as defined by independent claim 1, from which claim 10 depends. Applicants thus respectfully request the Examiner to reconsider this rejection and find claim 10 to be in condition for allowance.

35 USC § 103(a) Rejection - Claim 12

Independent claim 12 was rejected by the Examiner under 35 USC 103(a) as being unpatentable over Degani, in view of Ikuina, Higuchi, Lin and Imanaka, for all of the reasons discussed above in association with the rejection of the previous claims. In light of the lack of teaching in Ikuina regarding the use of a separate ceramic substrate to provide and support *all* of the "conductors" that are "positioned so as to selectively operate the array of mirrors" as defined by claim 12, applicants assert that this combination of references cannot be found to render obvious the subject matter of claim 12. It is therefore respectfully requested that the Examiner reconsider this rejection and find claim 12 to be allowable over the cited combination.

35 USC § 103(a) Rejection - Claims 15 and 16

Lastly, the Examiner rejected claims 15 and 16 under 35 USC 103(a) as being unpatentable over Degani in view of Ikuina and Higuchi (as applied to claim 13, above), in further view of US Patent 5,995,688 (Aksyuk), of record. The Aksyuk reference was cited by the Examiner as teaching bonding of a MEMS substrate to an SiOB substrate. However, there is no teaching in Aksyuk of bonding a silicon layer (supporting MEMS devices) to a *ceramic* substrate supporting MEMS electronics. Applicants thus assert that the combination of Aksyuk with Degani, Ikuina and Higuchi cannot be found to render obvious the subject matter of the present invention as defined by claims 15 and 16.

Carr 3-10-3

Applicants have amended claim 1 to correct a typographical error. It is asserted that this amendment cannot be considered as "new matter" and should not require a further search by the Examiner. Indeed, applicants believe that with this correction to claim 1, all claims 1-17 are now in condition for allowance over the various references cited by the Examiner. Applicants thus respectfully request the Examiner to reconsider each rejection and find the claims to be allowable. If for some reason or other the Examiner does not agree that the case is ready to issue and believes that an interview or telephone conversation would further the prosecution, the Examiner is invited to contact applicants' attorney at the telephone number listed below.

Respectfully submitted,

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